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ber 20, 1921, and January 1, 1922. Their weight varied from 250 to 300 pounds.

With this information I called at the office of the Atlantic Coast Fisheries Company, owners, at Fulton Market, where Mr. J. M. Matthews, in charge of the office, after interviewing Captain Emil Rasmusen of the schooner *Ruth M. Martin*, made the following statement:

While fishing for tilefish 120 miles E. S. E. of Ambrose Channel lightship, a swordfish was found on the trawl line when hauled to the surface. The fish was entangled in the trawl apparently in an effort to obtain some of the tilefish that had been hooked. The tilefish near where the swordfish was entangled were cut and bruised, indicating that they had been attacked. There was no indication that the swordfish had been hooked or had taken any bait. The trawl line was looped around the sword close up to the head and wrapped around the body several times. On this trip three swordfish were taken on the trawls in the same manner. One weighed 265 pounds and had a sword about five feet in length. The other two weighed 254 and 185 pounds, respectively. The tilefish trawl had 320 hooks nine feet apart. The fishing ground is on the edge of the Gulf Stream.

I then interviewed Captain Jack Rasmusen of the schooner *Benjamin W. Latham*. He reported having taken five swordfish on tilefish trawls during the holidays, with a total weight of 990 pounds, the trawls being set at depths of 70 to 115 fathoms.

The masters of all four vessels stated that swordfish had never been caught in this manner before so far as they knew. There were no signs of swordfish at the surface when any of the trawl catches were made.

In going into the details of the matter, I was interested chiefly in ascertaining whether the swordfishes had actually gone to the bottom in search of food, but there does not seem to be any positive evidence on this point. The masters of the vessels thought that the unusual catches on the trawl lines were first felt at about 25 fathoms below the surface. All the swordfishes were much tangled up in the lines and most of them were dead when brought up. They probably attempted to raid the trawls

while they were being lifted, and it is possible that some of them did so at depths considerably greater than that at which they were first noticed.

CHAS. HASKINS TOWNSEND
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NEW YORK,

MEXICAN ARCHEOLOGY

TO THE EDITOR OF SCIENCE: A somewhat inaccurate account of the communication on "Recent archeological discoveries in Mexico" that I made to the Royal Anthropological Society in London on November 22, 1921, having been reprinted in SCIENCE (April 7, 1922) from *Nature*, I would be obliged if you would permit me to refer those interested in the subject to the exact report of my text printed in *Man* (January, 1922), to rectify the following inaccuracies:

It was in 1909, not "in 1920" that specimens of the sub-gravel type were first brought to my notice. It was in the great pyramid of the Sun at Teotihuacan and not in the recently uncovered and reconstructed "small pyramid" that Señor Gamio pierced a tunnel. It was an age of two thousand years and not of "twenty thousand years" that the late distinguished volcanist, Dr. Temple Anderson, tentatively assigned to the lava bed at Coyoacan under which a second type of clay figurines was discovered. In his remarks Mr. T. A. Joyce referred to a figurine acquired by the British Museum "from Michoacan, Mexico," and not from "Ecuador."

ZELIA NUTTALL

QUOTATIONS

THE ISOTOPES OF TIN

THE insensitivity of the photographic plate in recording positive rays when compared with its sensitivity to light has long been observed, and has been accounted for by the fact that the action of positive rays is purely a surface effect. There has, therefore, always been the hope that considerable improvement could be made in this direction by increasing the concentration of the bromide particules on the surface of the gelatine. This hope has now been realized to some extent by the use of a method which, I understand, has been devised for the production of

Schumann plates. It consists essentially in dissolving off more or less of the gelatine by means of acid. I have not yet succeeded in obtaining certain or uniform effects, but in the most favorable cases the sensitivity of the "half tone" plates used in the mass-spectrograph has been increased ten to twenty times without seriously altering their other valuable properties.

The immediate result has been the definite proof of the complex nature of the element tin which had been previously suspected (*Phil. Mag.*, xlii, p. 141, July, 1921). Tin tetramethide was employed, and a group of eight lines corresponding approximately to atomic weights 116 (c), 117 (f), 118 (b), 119 (e), 120 (a), 121 (h), 122 (g), 124 (d) was definitely proved to be due to tin. This conclusion was satisfactorily confirmed by the presence of similar groups corresponding to $\text{Sn}(\text{CH}_3)$, $\text{Sn}(\text{CH}_3)_2$ and $\text{Sn}(\text{CH}_3)_3$. The intensities of the various components indicated by the letters in brackets agree quite well with the accepted chemical atomic weight 118.7, and incidentally preclude the possibility that any of the lines, with the possible exception of the extremely faint one at 121, are due to hydrides.

The spacing of these eight lines, which are only just resolved, show that their differences are integral to the highest accuracy, but the lines themselves compared with known lines on the plate give atomic weights always tending to be 2 or 3 parts in 1,000 too light for the above whole numbers. That this remarkable divergence can not be explained as experimental error is very strongly indicated by the following consideration. The discharge tube had been used previously to investigate some very pure xenon. The line due to $\text{Sn}^{120}(\text{CH}_3)$ should therefore have appeared exactly halfway between the two strong xenon lines 134, 136. It was actually quite unmistakably nearer the former, so much so that the two were only partially resolved. The same irregular grouping repeated itself in another portion of the field in the following spectrum. It seems, therefore, difficult to resist the conclusion that the isotopes of tin have atomic weights which are less than whole numbers by one fifth to one third of a unit of atomic weight, but satisfactory settlement of this important point will probably

have to be deferred till a more accurate mass-spectrograph has been made.

Incidentally I may add that the presence of the two faint components of xenon 128 and 130 previously suspected has now been satisfactorily confirmed.—F. W. Aston in *Nature*.

SPECIAL ARTICLES

CRATERLETS IN EAST-CENTRAL ARKANSAS PROBABLY DUE TO THE NEW MADRID EARTHQUAKE

THE following brief description of six craterlets occurring on and about the border between the southeast quarter of Sec. 31 and the northeast quarter of Sec. 32, T. 8 N., R. 7 E., is of interest because it apparently extends the sphere of destructive violence of the New Madrid earthquake from that illustrated in Bulletin 494, United States Geological Survey, to within about 20 miles northwest of Memphis. These are also of interest because few, if any, larger than these have been described.

Occurrence: Five of the craterlets occur on the upper surface of one of the low ridges of the Mississippi flood plain. The sixth is a double craterlet, occurring on the slope of the ridge. They apparently bear no relationship to each other except as regards origin and age. With the exception of the double craterlet, they are saucer-shaped, with diameters ranging from 10 to 40 feet, and depths ranging from 2 to 6 feet. One part of the double craterlet is about 15 feet by 10 feet along the diameters of its elliptical outline. The smaller craterlet is about 10 by 8 feet along similar directions. They are separated by a ridge about three feet high. The bottoms of both craterlets lie about 4 to 5 feet below the surrounding surface. These craterlets are all located within a radius of 800 feet.

Origin: The ridge on which these craterlets occur has long been cultivated, and between cultivation and sporadic attempts to fill them up, any evidences of rims that may have surrounded the craters have disappeared. However, the material about the craterlets is made up of the characteristic fine sand and clay that appears in all the dredgings in this vicinity, together with rocks that range in size from 1 inch through to 11x4x5 inches. These rocks.